PERIOD BETWEEN" IOEVERSALS

The period between reversals has a direct bearing upon the design of the checker in two important particulars: the heating and cooling time determines the weight of checker brick required and the thickness of the brick composing it. There is a limit to the quantity of heat which may be absorbed and given out by the brickwork. The practical limit is reached when the entire mass of brickwork is raised to a temperature at which heating gases pass through the checker with a "very slight or no drop in temperature.

The economical limit is reached when fche heating gases leave the checkerwork at such, a temperature that during the period when the checker is giving up heat the brickwork temperature does not drop below the initial temperature of the incoming gases plus the temperature differential necessary for heat transfer.

The most important variable, the period between reversals, is beyond the control of the designer. The furnaces are operated by two or three shifts of men. Each shift usually has certain definite portions of the furnace to keep in repair and will so operate the furnace, when it is possible so to do, in a manner to favor their section and throw the burden of repair work upon the other shifts. This leads to irregular working. Sidney Cornell *(Chemical and Metallurgical Engineering,* May, 1913) cites the case of a 60-ton furnace. There were 509 reversals in a week. The average time period between reversals was 10 minutes. The longest period was 70 minutes, the shortest 2 minutes. Consecutive periods differed widely in their duration. The following time periods in minutes were scaled from a diagram he presented:

R 15 R 25 R 20 R 15 R 16 R 23 R 24 R 24 R 34 R 22 R53 R 12 R 9.

(R stands for reversal.)

Quick reversals are necessary at certain stages of the operation, but it is certainly desirable that the work should be divided, as nearly equally as possible, between the two ends of the furnace. When the time factor depends entirely upon the human element it is absolutely impossible to avoid considerable irregularity in operation. At the same time melt variations will prevent automatically timed reversals, except during certain stages of the heat.

However, reversing machines are available which will operate the valves in a predetermined sequence and time the reversals